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Global existence and finite-time blow-up for a nonlocal parabolic equation

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Authors:
Mohamed El Massaoudi[1]
Ahmed Youssfi[1]
Khalil Benhaddouch[1]

[1] Sidi Mohamed Ben Abdellah University, National School of Applied Sciences, Laboratory of Applied Sciences and Innovative Technologies My Abdellah Avenue, Road Imouzer, P.O. Box 72 Fez-Principale, 30 000 Fez, Morocco.

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Abstract

The study of global existence and blow-up of weak solutions for parabolic equations has been extensively investigated in the literature (See [4, 5, 6, 7]). By combining the comparison principle with variational methods, we investigate the global existence and blow-up behavior of solutions to a nonlocal-parabolic equation under homogeneous Dirichlet boundary conditions and an appropriate initial condition.

References

[1] C. Bucur and E. Valdinoci (2016), Nonlocal Diffusion and Applications, Lecture Notes of the Unione Matematica Italiana, Vol. 20, Springer, Cham.
[2] G. Y. Chen, J.-C. Wei, and Y. F. Zhou (2019), Finite time blow-up for the fractional critical heat equation in R n , Nonlinear Anal., 190, 111593.
[3] E. Di Nezza, G. Palatucci, and E. Valdinoci (2012), Hitchhiker's guide to the fractional Sobolev spaces, Bull. Sci. Math., 136(5), 521–573.
[4] Y. Fu and P. Pucci (2016), On solutions of space-fractional diffusion equations by means of potential wells, Electron. J. Qual. Theory Differ. Equ., 2016(70), 1–17.
[5] F. Gazzola and T. Weth (2005), Finite time blow-up and global solutions for semilinear parabolic equations with initial data at high energy level, Differ. Integral Equ., 18(9), 961–990.
[6] M. Musso, Y. Sire, J.-C. Wei, Y. Q. Zheng, and Y. F. Zhou (2019), Infinite time blow-up for the fractional heat equation with critical exponent, Math. Ann., 375(1–2), 361–424.
[7] L. E. Payne and D. H. Sattinger (1975), Saddle points and instability of nonlinear hyperbolic equations, Israel J. Math., 22(3), 273–303.